Jefferson Parish, Louisiana
Cooperating Technical Partner
Mapping Activity Statement

Agreement 1 – Digital Topographic Data Development, Hydrologic and Hydraulic Analyses and Floodplain Mapping, Digital FIRM Preparation, Digital Base Map Sharing, and Digital FIRM Maintenance

In accordance with the Cooperating Technical Partner (CTP) Memorandum of Agreement dated May 4, 2001, between Jefferson Parish, Louisiana and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement Number 1 is as follows:

General

1. **Funding/Cost Sharing:**

2. **Contractors:** The CTP's in-house staff shall perform part of the work effort. THE CTP may use consultants or contractors for LIDAR services, hydrologic and hydraulic modeling, computer data base management and map preparation, digital base map sharing, digital DFIRM maintenance, and quality control/quality assurance for the various tasks. Selection of all consultants and contractors will be in accordance with the requirements of 44 CFR 13.36 whenever payment of all or part of such fees is derived from Federal funds. The Parish may use existing consultants providing the Parish awarded such contracts in accordance with 44 CFR 13.36 if any part of their fees for this work are derived from Federal funds. All award procedures are subject to review and acceptance by FEMA.

3. **Schedules and Milestones**: A Project Schedule provided as an attachment to this Mapping Activity Statement identifies tasks to be performed by the CTP and its consultants, the MCC, and FEMA. Milestones identified in each task that follows reflect the major objectives of the respective tasks. The Milestones are to be completed in accordance with the dates shown on the Project Schedule.

Task A. Digital Topographic Data Development

1. **Objective and Scope:** The objective of this Mapping Activity is to develop digital topographic data for 1) the East Bank of Jefferson Parish including the cities of Harahan and Kenner and 2) the West Bank of Jefferson Parish within the confines of the Hurricane Protection Levee, including the cities of Gretna and Westwego. The digital topographic data will be used for hydraulic modeling and floodplain mapping to produce Digital Flood Insurance Rate Maps (DFIRMs) for the areas of 1) the East Bank of Jefferson Parish including the cities of Harahan and Kenner and 2) the West Bank of Jefferson Parish within the confines of the Hurricane Protection Levees, including the cities of Gretna and Westwego. LIDAR will be the primary source of the digital topographic data. The CTP will supplement LIDAR data as needed with topographic information using traditional surveying techniques. Topographic data will be at two-foot contour intervals or less.

2. **Period of Performance**: This Digital Topographic Data Development will begin on or before February 1, 2002 and will be completed no later than June 30, 2002. This Mapping Activity may be terminated at the option of FEMA or Jefferson Parish, Louisiana in accordance with the provisions of the May 4, 2001, CTP Memorandum of Agreement. Submission of back-up documentation may occur at a later date.

3. **Standards:** The following standards and documents are relevant to this Mapping Activity:
   - Survey Methodology:
     - Global Positioning System (GPS) Surveys: Follow National Geodetic Survey publication NGS-58, "Guidelines for Establishing GPS-Derived Ellipsoid Heights (Standard: 2 cm and 5 cm)," November 1997.
     - Aerial Surveys: Follow United States Army Corps of Engineers (USACE) EM 1000-1-1000, "Photogrammetric Mapping," March 31, 1993.
     - Conventional Surveys: Follow standard American Congress on Surveying and Mapping (ACSM) procedures.
     - Hydrographic Surveys: Follow USACE EM 1110-2-1003, "Hydrographic Surveys," October 31, 1994.
   - Draft LIDAR specifications are available on FEMA's Web site at www.fema.gov/mit/tsd/MM_lidar.htm.
   - *Guidelines and Specifications for Study Contractors* (FEMA 37). FEMA is in the process of revising Aerial Mapping and Surveying Specifications in FEMA 37, Appendix 4. The revisions will include procedures for evaluating Triangulated Irregular Network (TIN) data in accordance with the new National Standards for Spatial Data Accuracy (NSSDA) for data used in automated and semi-automated hydrologic and hydraulic modeling. Once those specifications are complete, they will apply to this Mapping Activity.
   - Digital mapping submissions will comply with the requirements of Chapter 9 and Appendix 7 of FEMA 37.

4. **Products:** Jefferson Parish, Louisiana shall make the following products available:
   - TIN data on CD-ROM.
   - Hardcopy topographic maps.
   - Report summarizing methodology and results.
   - Completed Form 5 of *Revisions to National Flood Insurance Program Maps, Application/Certification Forms and Instructions* (MT-2).

- Checkpoint analyses to assess the accuracy of TIN data, including Root Mean Square Error (RMSE) calculations to support vertical accuracy.
- Identification of remote sensing data voids and methods used to supplement data voids.
- National Geodetic Survey (NGS) data sheets for Network Control Points (NCP) used to control remote sensing and ground surveys.

5. Schedule and Milestones:

Milestone 1: Products for the first milestone to be provided to the FEMA Project Officer include:

- Documentation of methodology, data analyses, date of survey/data collection, NCP, and other relevant information.
- Work plan for supplementing data voids caused by limitations of remote sensing and/or source of any supplementary data collection.

Milestone 2 (Final Products): Final products for the first milestone to be provided to the FEMA Project Officer include:

- TIN data on CD-ROM.
- Hardcopy topographic maps.
- Report summarizing methodology and results.
- Completed Form 5 of MT-2.
- Checkpoint analyses to assess the accuracy of TIN data including RMSE calculations to support vertical accuracy.
- Identification of remote sensing data voids and methods used to supplement data voids.
- NGS data sheets for NCP used to control remote sensing and ground surveys.

Final products will be made available in accordance with the Period of Performance described in Section 2 of this Mapping Activity Statement.

6. Certification: The following certifications apply to this Mapping Activity (as appropriate):

- Registered Professional Engineer or Licensed Land Surveyor will certify topographic information, in accordance with 44 CFR 65.5(c).
- Certification of topographic information by the American Society for Photogrammetry and Remote Sensing (ASPRS) is also acceptable.

7. Technical Assistance and Resources: Jefferson Parish, Louisiana may obtain copies of FEMA-issued Letters of Map Change (LOMCs), archived engineering back-up data, and data collected as part of the Mapping Needs Assessment Process from FEMA's Mapping Coordination Contractor (MCC). The MCC may be contacted at 1-877 FEMA MAP (1-877-336-2627). General technical and programmatic information, such as FEMA 265, the Quick-2 computer program, and the MT-2 forms, can be downloaded from FEMA's Flood Hazard Mapping Web site (www.fema.gov./mit/tsd/). Specific technical and programmatic support may be provided through FEMA's MCC; such assistance should be requested through the FEMA MCC Project Officer specified in Section D.10 of this Mapping Activity Statement.

Jefferson Parish, Louisiana may also consult with the FEMA MCC Project Officer to request support in the areas of selection of data sources, selection of digital data accuracy

standards, assessing vertical data accuracy, selection of data collection methods, selection of sub-contractors, and GIS-based engineering and modeling training.

The CTP will coordinate the following task as a minimum with the MCC and/or FEMA.

- Initial discussions with MCC and FEMA to determine contour intervals and review proposed scope of work for LIDAR contractor.
- Submission of sample TIN and hardcopy topographic maps for review by MCC.
- Review of proposed QA/QC plan by MCC.

In addition, the CTP shall inform the Oil Spill Coordinator, Office of the Governor of the State of Louisiana, of proposed LIDAR work to insure compliance with state standards.

8. **Quality Assurance/Quality Control (QA/QC) Procedures:** Jefferson Parish, Louisiana will undertake internal QC reviews to ensure that the products described under Section A.4 of this Mapping Activity Statement conform with the standards outlined under Section A.3 of this Mapping Activity Statement. Additionally, an independent review for compliance with these standards will be undertaken by independent licensed land surveyors in the State of Louisiana. The QA/QC procedures outlined in Chapter 10 of FEMA 37 should be followed during the development of the approximate Zone A analyses and mapping.

9. **Reporting:** Reporting requirements will be in accordance with Agreement Articles A.5 & A.6.

Task B. Hydrologic and Hydraulic Analyses and Floodplain Mapping

1. **Objective and Scope:** The objective of this Mapping Activity is to develop detailed hydrologic and hydraulic analyses and floodplain and floodway mapping in Jefferson Parish, Louisiana. Hydrologic analyses will be completed for approximately 125.4 square miles of drainage area, and hydraulic analyses and floodplain mapping will be completed for approximately 340 linear miles of canal waterways, drainage ditches, and culverts. The area includes about 49.6 square miles on the East Bank and 75.8 square miles on the West Bank within the Hurricane Protection Levees. A total of 23 major pumping stations located on 21 sites serve the study area. One additional major pumping station is currently under construction and scheduled for completion during the course of this study. The analyses shall include all flooding sources. This work will cover all or part of eleven (11) existing panels. The panels will be re-tiled as necessary to conform with USGS quad maps, 1000 foot scale.

   GIS-based hydrologic and hydraulic modeling and mapping techniques will be applied to develop GIS data sets in support of the automation or semi-automation of modeling and floodplain mapping.

2. **Period of Performance:** This Mapping Activity will begin on or before December 1, 2001 and will be completed no later than February 1, 2004. This Mapping Activity may be terminated at the option of FEMA or Jefferson Parish, Louisiana in accordance with the

provisions of the May 4, 2001, CTP Memorandum of Agreement. Submission of supporting documentation may occur after that date.

3. **Standards:** The following standards and documents are relevant to this Mapping Activity:
   - Detailed hydrologic and hydraulic analyses and floodplain mapping will follow the standards set forth in FEMA 37, *Guidelines and Specifications for Study Contractors* (January 1995), and Title 44 of the Code of Federal Regulations (CFR), Part 65. FEMA 37 is available at FEMA's Web site at http://www.fema.gov/mit/tsd/EN_reg.htm. Title 44 of the CFR is available at FEMA's Web site at www.access.gpo.gov/cgi-bin/cfrassemble.cgi?title=199944.
   - Computer models used for hydrologic and/or hydraulic analyses will meet the requirements of 44 CFR 65.6(a)(6) and be on FEMA's *Numerical Models Accepted by FEMA for NFIP Usage* (http://www.fema.gov/mit/tsd/EN_modl.htm).
   - Topographic mapping used to delineate floodplains and floodways will be of adequate scale and topographic definition to provide reasonable accuracy. Planimetric features will be compatible with the base map (with respect to horizontal accuracy) selected by FEMA for Digital FIRM production. Topographic mapping taken from aerial photogrammetry or surveys will comply with the requirements of Appendix 4 of FEMA 37
   - Any levee or dike systems to be shown on the community's FIRM as providing protection from the 1% annual chance flood will comply with the requirements of 44 CFR 65.10. Chapter 7 of FEMA 37 provides guidelines for evaluating levee and dike systems.
   - Flood elevations and floodplain and floodway boundaries will reasonably tie in to non-revised information in accordance with 44 CFR 65.6(a)(2).
   - The floodway will be established in accordance with 44 CFR 65.7, as well as any applicable state and/or community requirements.
   - Digital mapping will comply with the requirements of Chapter 9 and Appendix 7 of FEMA 37.
   - Automated data processing and modeling algorithms for GIS-based modeling and mapping will be documented and provided to FEMA to ensure that they are consistent with the standards outlined above. Digital data sets (such as elevation, basin, or land use data) will be documented and provided to FEMA for approval prior to performing the analysis to ensure that they meet minimum requirements. If non-commercial (i.e., custom developed) software is used for the analysis, then full user documentation, technical algorithm documentation, and the software will be provided to FEMA for review prior to performing the scope of work.
   - Digital Elevation Models (DEMs) and field survey data will meet vertical accuracy requirements contained in Appendix 4 of FEMA 37.

4. **Products:** Jefferson Parish, Louisiana will make available items outlined in Chapter 11 of FEMA 37 in the Technical Support Data Notebook (TSDN) format. These include:
   - Digital 1% and 0.2% annual chance floodplain and floodway boundaries;
   - Digital profiles of the 10%, 2%, 1%, and 0.2% annual chance water-surface elevations, representing existing conditions;
   - Flood Insurance Study (FIS) report;
   - Floodway data tables;
   - Digital copies of all hydrologic and hydraulic modeling (input and output files); and

- All back-up data used in the analyses or mapping.

For GIS-based modeling and mapping, Jefferson Parish, Louisiana will deliver all digital input and output data, intermediate data processing products, GIS data layers, and final products in the format of the Digital Flood Insurance Rate Map (DFIRM) database structure.

5. Schedule and Milestones:

Milestone 1 (Scoping Phase): Products for the first milestone to be provided to the FEMA Project Officer include:

- Annotated copies of effective FIRMs depicting limits of proposed study.
- Documentation of the proposed source of topographic data, scale, contour interval, source/methodology, date of survey/data collection, vertical and horizontal datums, and comparison of planimetric features with the DFIRM base map selected by FEMA for DFIRM production.
- A written summary of the initial data research, proposed analysis methodologies, and a work plan.
- Documentation of digital data sets to be used (such as elevation, basin, and land use data). Full user documentation, technical description of methodologies and algorithms, and a copy of the source codes and custom-developed software applications for GIS-based modeling will also be provided.
- Copies of topographic maps depicting proposed cross section locations.

Milestone 2 (Hydrology Phase): Products for the second milestone to be provided to the FEMA Project Officer include draft hydrologic analyses in accordance with the TSDN format.
Milestone 3 (Hydraulics Phase): Products for the third milestone to be provided to the FEMA Project Officer include the hydraulic models and sample floodplain mapping in accordance with TSDN format.

Milestone 4 (Final Products): Final products to be provided to the FEMA Project Officer include:

- The completed TSDN and accompanying data containing the information outlined in Section 5 of this Mapping Activity Statement.
- A QA/QC report documenting the results of the independent review of all computational and data processing procedures.

Final products will be made available in accordance with the Period of Performance described in Section B.2 of this Mapping Activity Statement.

6. Certification: The following certifications apply to this Mapping Activity (as appropriate):

- Hydrologic and/or hydraulic analyses, calculations and data will be certified by a registered Professional Engineer or Licensed Land Surveyor in accordance with 44 CFR 65.6(f).
- Topographic information will be certified by a registered Professional Engineer or Licensed Land Surveyor in accordance with 44 CFR 65.5(c).

- If fill is to be considered in the mapping to raise land areas to or above the 1% annual chance flood elevation, certification of the fill will be provided in accordance with 44 CFR 65.5(a)(6) by the community's NFIP permit official, a registered Professional Engineer, or a Licensed Land Surveyor.
- Any levee systems to be accredited as discussed in Section 4 of this Mapping Activity Statement will be certified in accordance with 44 CFR 65.10(e).

7. **Technical Assistance and Resources:** Jefferson Parish, Louisiana may obtain copies of FEMA-issued Letters of Map Change (LOMCs), archived engineering back-up data, and data collected as part of the Mapping Needs Assessment Process from FEMA's Mapping Coordination Contractor (MCC). The MCC may be contacted at 1-877 FEMA MAP (1-877-336-2627). General technical and programmatic information, such as FEMA 265, the Quick-2 computer program, and the MT-2 forms, can be downloaded from FEMA's Flood Hazard Mapping Web site (www.fema.gov./mit/tsd/). Specific technical and programmatic support may be provided through FEMA's MCC; such assistance should be requested through the FEMA MCC Project Officer specified in Section D.10 of this Mapping Activity Statement.

   Jefferson Parish, Louisiana may also consult with the FEMA Project Officer to request support in the areas of selection of data sources, digital data accuracy standards, assessment of vertical data accuracy, data collection methods or sub-contractors, and GIS-based engineering and modeling training.

   The CTP will coordinate the following task as a minimum with the MCC.

   - Assistance in preparation of the Scopes of Work for Hydrologic and Hydraulic Models.
   - Co-ordination on model selection for hydrology and hydraulics.
   - Review of hydrologic models.
   - Review of hydraulic models.

8. **Quality Assurance/Quality Control (QA/QC) Procedures:** Jefferson Parish, Louisiana will undertake internal QC reviews to ensure that the products described under Section B.4 of this Mapping Activity Statement conform with the standards outlined under Section B.3 of this Mapping Activity Statement. Additionally, an independent review for compliance with these standards will be undertaken by firms selected in accordance with applicable federal and Parish guidelines.

   For GIS-based, automated modeling, QA/QC activities should ensure automated calculations are reasonable and in compliance with standard flood modeling and mapping approaches. Jefferson Parish, Louisiana will document internal QA/QC procedures to ensure all calculations and data processing were reviewed.

   The CTP shall review the hydrologic model for accuracy in sub-basin geometry, stage storage relationships, and hydrograph inputs. The CTP shall review the hydrologic model cross-sections, elevations, and channel geometry for accuracy.

9. **Reporting:** Reporting requirements will be in accordance with Agreement Articles B.5 & B.6.

Task C. Digital FIRM Preparation

1. **Objective and Scope:** The objective of this Mapping Activity is the conversion of effective Flood Insurance Rate Maps (FIRMs) to a digital format that conforms to FEMA's Digital Flood Insurance Rate Map (DFIRM) specifications. Revisions to the FIRM made through FEMA Letters of Map Change (LOMCs) issued since March 23, 1995 will also be incorporated into the DFIRM. This work will cover all or part of eleven (11) existing panels revised under Activity B and eight (8) panels not revised under Activity B. Areas not revised under Activity B will be digitized based on the effective map information. All panels will be re-tiled as necessary to conform with USGS quad maps, 1000 foot scale.

2. **Period of Performance:** This Mapping Activity will begin on or before October 1, 2001 and will be completed no later than June 1, 2004. This Mapping Activity may be terminated at the option of FEMA or Jefferson Parish, Louisiana in accordance with the provisions of the May 4, 2001, CTP Memorandum of Agreement.

3. **Standards:** The following documents are relevant to the creation of DFIRMs and this Mapping Activity:
   - *Guidelines and Specifications for Study Contractors* (FEMA 37) available via the internet at http://www.fema.gov/mit/tsd/EN_reg.htm.
   - *Guidelines and Specifications for Flood Map Production Coordination Contractors* (Draft February 17, 1999).
   - *Base Map Standards for DFIRMs* (FEMA). The minimum base map standards for DFIRMs include the following requirements for DFIRM base map data:
   - cover the community(s) or county(s) completely;
   - be distributable by FEMA to the public;
   - meet the minimum accuracy requirements outlined in the document; and
   - include all required features.
   - *DFIRM Graphic Specifications* (FEMA, Draft November 2000), and *Standard DFIRM Spatial Database Specifications* (FEMA, Draft May 2000).
   - *Standards for Digital Orthophotos* (U.S. Geological Survey, National Mapping Program, December 1996).
   - *Content Standards for Digital Geospatial Metadata* (Federal Geographic Data Committee, 1998).

4. **Products:** Jefferson Parish, Louisiana shall make the following products available:
   - Quarterly status reports that include the percentage of work completed for this Mapping Activity, major accomplishments made during the quarter, any major problems encountered, and the resolution of any major problems encountered.
   - DFIRM mapping files in one of the GIS file formats specified in FEMA's *DFIRM Graphic Specifications.* These files should be provided on CD-ROM.
   - DFIRM database files in one of the database formats specified in FEMA's *Standard DFIRM Spatial Database Specifications.* These files should also be provided on CD-ROM.

- Metadata files describing the DFIRM data. These files will include the required information and follow the examples shown in FEMA's *Standard DFIRM Spatial Database Specifications.*
- A complete set of plots of the DFIRM panels showing all detail at the scale(s) approved under the first milestone. Acceptable DFIRM scales are 1"=500', 1"=1000', and 1"=2000'. Plots should conform to FEMA's *DFIRM Graphic Specifications.*
- A Quality Assurance/Quality Control (QA/QC) report that includes a description and the results of all automated or manual quality assurance steps taken during the preparation of the DFIRMs.
- Map documents or drawing files corresponding to the finished hard copy plots in a format coordinated with FEMA and the MCC. These files will allow the MCC to produce negatives for reproduction of the final DFIRMs.

5. Schedule and Milestones:

Milestone 1: Products for the first milestone to be provided to the FEMA Project Officer include:

- A description of the proposed DFIRM base map including digital base map information checklist (available in FEMA 37);
- A diagram showing the proposed DFIRM panel layout for the new panels that includes the community and/or county boundary(s) and scale of all panels;
- A copy of the current FIRM index; and
- QA/QC report.

Milestone 2: Final products to be provided to the FEMA Project Officer include:

- A set of digital files containing DFIRM data for one FIRM panel. The digital files will include the base map data as well as all FIRM information converted to DFIRM format.
- The mapping files will be accompanied by the appropriate DFIRM database tables described in FEMA's *Standard DFIRM Spatial Database Specifications.*
- Metadata files describing the DFIRM data.
- A plot of the DFIRM panel showing all detail at the scale approved under the first milestone. The plot should conform to the standards outlined in FEMA's *DFIRM Graphic Specifications.*
- QA/QC report.

Milestone 3 (Final Products): Final products to be provided to the FEMA Project Officer include:

- A set of digital files containing all DFIRM data for the entire community(s) and/or county(s) defined in Section 1 of this Mapping Activity. The digital files will include the base map data as well as all FIRM information converted to DFIRM format.
- The mapping files will be accompanied by the appropriate DFIRM database tables described in FEMA's *Standard DFIRM Spatial Database Specifications.*
- Metadata files describing the DFIRM data.
- A complete set of plots of the DFIRM panels showing all detail at the scale(s) approved under the first milestone. The plots should conform to the standards outlined in FEMA's *DFIRM Graphic Specifications.*

- QA/QC report.

6. **Certification:** The DFIRM metadata files will include a description of the horizontal and vertical accuracy of the DFIRM base map and floodplain information.

7. **Technical Assistance and Resources:** Jefferson Parish, Louisiana may obtain copies of FEMA-issued Letters of Map Change (LOMCs), archived engineering back-up data, and data collected as part of the Mapping Needs Assessment Process from FEMA's Mapping Coordination Contractor (MCC). The MCC may be contacted at 1-877 FEMA MAP (1-877-336-2627). General technical and programmatic information, such as FEMA 265, the Quick-2 computer program, and the MT-2 forms, can be downloaded from FEMA's Flood Hazard Mapping Web site (www.fema.gov./mit/tsd/). Specific technical and programmatic support may be provided through FEMA's MCC; such assistance should be requested through the FEMA Project Officer specified in Section D.10 of this Mapping Activity Statement and may include:
   - Preparation of a DFIRM panel layout and panel grid in digital format;
   - Sample DFIRM mapping and database files;
   - Technical assistance in the form of training and technical guidance; and
   - DFIRM production tools, software, cell libraries, automated QA/QC tools, etc., that FEMA has developed for its own use.

8. **Quality Assurance/Quality Control (QA/QC) Procedures:** Jefferson Parish, Louisiana will undertake internal QC reviews to ensure that the products described under Section C.4 of this Mapping Activity Statement conform with the standards outlined under Section C.3 of this Mapping Activity Statement. Additionally, an independent review for compliance with these standards will be undertaken by firms selected in accordance with federal and Parish guidelines. The procedures used for the independent review may include a mixture of manual and automated QA/QC procedures and will concern the following:
   - Complete data capture of all required DFIRM features will be assured.
   - Data capture without distortion (other than that resulting from the addition of horizontal control and/or edgematching) will be assured.
   - Topological fidelity of the DFIRM files will be assured. This includes assurance that the files contain no overshoots or dangles, gaps, node errors, label errors, or pseudo nodes and assurance that all area features are closed.
   - FEMA's horizontal and vertical accuracy requirements for DFIRMs will be met.
   - All problems with internal edgematching between panels will be resolved. If this Mapping Activity covers more than one community, any problems with edgematching between contiguous communities will also be resolved. This includes both "graphical" mismatches as well as mismatches in engineering data portrayed on the DFIRM (e.g., floodplain widths, base flood elevations, etc.).
   - Complete data capture of all required DFIRM database features will be assured. In addition, logical data encoding checks should be performed to assure consistency within the DFIRM database. For example, feature attributes will fall within the specified range and domain for that feature type.
   - Hardcopy DFIRM will be legible and plotted at the scale(s) agreed upon after the first milestone of this Mapping Activity.

9. Reporting: Reporting requirements will be in accordance with Agreement Articles C.5 & C.6.

Task D. Digital Base Map Sharing

1. **Objective and Scope:** The objective of this Mapping Activity is the sharing of locally prepared digital base map data for use in preparing Digital Flood Insurance Rate Maps (DFIRMs). The digital base map data will meet FEMA's base map standards, be provided in a format compatible with FEMA's DFIRM specifications, and be available for distribution to the public. The base maps shall be in vector format.

   FEMA's base map standards include standards for planimetric information in vector format, as well as provision for raster data such as digital orthophotos. FEMA encourages communities that have not already developed digital base map data to consider partnering with the U.S. Geological Survey (USGS) or other entities for the development of Digital Orthophoto Quarter Quadrangles (DOQs).

   This Mapping Activity is for the sharing of digital base map data for the communities of Gretna, Harahan, Kenner, Westwego, unincorporated Jefferson Parish on the East Bank, and those portions of unincorporated Jefferson Parish on the West Bank within the Hurricane Protection Levees.

2. **Period of Performance:** This Mapping Activity will begin when the final DFIRMs are published, currently projected to be around October 2004. This Mapping Activity may be terminated at the option of FEMA or Jefferson Parish, Louisiana in accordance with the provisions of the May 4, 2001, CTP Memorandum of Agreement.

3. **Standards:** The following documents are relevant to the creation of DFIRMs and this Mapping Activity:
   - *Guidelines and Specifications for Study Contractors* (FEMA 37) available via the Internet at http://www.fema.gov/mit/tsd/EN_reg.htm.
   - *Base Map Standards for DFIRMs* (FEMA). The minimum base map standards include the following requirements for DFIRM base map data:
     - cover the community(s) or county(s) completely;
     - be distributable by FEMA to the public;
     - meet the minimum accuracy requirements outlined in the document; and
     - include all required features.
   - *Digital Flood Insurance Rate Map (DFIRM) Specifications* (Draft DFIRM Graphic Specifications, FEMA, November 2000, and Draft Standard DFIRM Spatial Database Specifications, FEMA, May 2000).
   - *Standards for Digital Orthophotos* (U.S. Geological Survey, National Mapping Program, December 1996).
   - *Content Standards for Digital Geospatial Metadata* (Federal Geographic Data Committee, 1998).
4. **Products:** Jefferson Parish, Louisiana shall make the following products available:
   - Digital base map files in one of the GIS file formats specified in FEMA's *Base Map Standards for DFIRMs.*

- Database files for the layers included in the digital base map in one of the database formats specified in FEMA's *Digital Flood Insurance Rate Map Specifications.* These files should be provided on CD-ROM.
- A completed Checklist provided by FEMA (template to be developed). This checklist will contain basic information about the base map data.
- Metadata files describing the digital base map data. These files will include the required information and follow the examples shown in FEMA's *Digital Flood Insurance Rate Map (DFIRM) Specifications.*
- Certifications that the base map data meet FEMA's minimum standards and specifications, and that FEMA has permission to distribute the data to the public with its DFIRM data.

5. **Schedule and Milestones:** Final products will be provided to the FEMA Project Officer in accordance with the period of performance defined in Section 2 of this Mapping Activity Statement.

6. **Certification:** The digital base map data will be accompanied by certification that the digital base map data meet FEMA's minimum standards and specifications. In addition, the metadata files will include a description of the horizontal and vertical accuracy of the digital base map information.

7. **Technical Assistance and Resources:** General technical and programmatic information can be downloaded from FEMA's Flood Hazard Mapping Web site (www.fema.gov/mit/tsd). Specific technical and programmatic support may be provided through FEMA's Mapping Coordination Contractor (MCC); such assistance should be requested through the FEMA MCC Project Officer specified in Section D.10 of this Mapping Activity Statement and may include:
   - Preparation of a DFIRM panel layout and panel grid in digital format;
   - Sample DFIRM mapping and database files;
   - Technical assistance in the form of training and technical guidance; and
   - DFIRM production tools, software, cell libraries, automated QA/QC tools, etc., that FEMA has developed for its own use.

8. **Quality Assurance/Quality Control (QA/QC) Procedures:** Jefferson Parish, Louisiana will undertake internal QC reviews to ensure that the products described under Section D.4 of this Mapping Activity Statement conform with the standards outlined under Section D.3 of this Mapping Activity Statement. Additionally, an independent review for compliance with these standards will be undertaken by undertaken by firms selected in accordance with federal and Parish guidelines. Examples of recommended QA/QC review items include the following:
   - Complete data capture of base map features.
   - Horizontal and vertical accuracy.
   - Topological fidelity of vector files. This includes reviews for overshoots or dangles, gaps, node errors, label errors, pseudo nodes, and closed area features.
   - Edgematching.
   - Complete data capture of all appropriate spatial database attributes. Logical data encoding checks should be performed to ensure consistency within the base map database.

9. **Reporting:** Reporting requirements will be in accordance with Agreement Articles D.5 and D.6.

10. **Points of Contact:** The FEMA Regional Project Officer is Gary Zimmerer, and the CTP Project Manager is Herbert Miller or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. If it is necessary, the assistance of FEMA's MCC should be requested through the FEMA Regional Project Officer, Gary Zimmerer.

Each party has caused this Mapping Activity Statement to be executed by its duly authorized representative.

Herbert Miller,
Director of Public Works
Jefferson Parish, Louisiana

9.19.01
Date

for Gary Zimmerer,
Region VI Project Officer
Federal Emergency Management Agency

9-26-01
Date

Jefferson Parish DFIRM
Mapping Activity Statement
Project Schedule

Task Description	Task No.	Start Date	End Date	QA/QC	MCC	FEMA	LIDAR	Topogrpahy	Hydraulic and Hydrology	GIS/Data Base Manager	Program Manager	USACE	Jefferson Parish
Submit Mapping Activity Statement	1	Jul-01	Sep-01										J1
Advertise for LIDAR, H & H and Program Manager Consultants	2	Jul-01					L1		H1		P1		J2
Submit Information on Selection of Topographic and GIS Consultants for Approval	3	Sep-01				F1		T1		G1			J3
Select LIDAR, H & H, and Program Manager Consultants	4	Sep-01					L2		H2		P2		J4
Negotiate GIS/Data Management, LIDAR, H & H, and Program Manager Contracts - Include FEMA Reporting	5	Sep-01	Nov-01			F2	L3		H3	G2	P3		J5
Award GIS/Data Management, LIDAR, Topo, H & H and Program Manager Contracts	6	Oct-01					L4	T2	H4	G3	P4		J6
Determination of Criteria for Pump Station Capacities to be Used in Models	7	Oct-01	Jan-01		M1	F3						C1	J7
Submit Copy of Current FIRM Index	8	Oct-01				F4							J8
Selection of Map Scale	9	Oct-01	Dec-01		M2	F5				G4			J9
Metadata Base Preparations	10	Nov-01	Mar-04							G5			
Select H & H Models	11	Dec-01	Feb-02						H5		P5		J10
Coordination with Oil Spill Coordinator, La. Governor's Office	12	Dec-01					L5				P6		
Perform LIDAR Flight and Reduce Data	13	Jan-02	May-02				L6						
Determination of Criteria for SELA Projects to be Included in DFIRM Study	14	Jan-02	Mar-02		M3	F6					P7	C2	J11
Select Events for Model Calibration and Verification	15	Jan-02	Mar-02						H6		P8		J12

Jefferson Parish DFIRM
Mapping Activity Statement
Project Schedule

Task Description	Task No.	Start Date	End Date	QA/QC	MCC	FEMA	LIDAR	Topogrpahy	Hydraulic and Hydrology	GIS/Data Base Manager	Program Manager	USACE	Jefferson Parish
Review of Proposed Hydrologic Modeling Techniques	16	Feb-02	Apr-02	x	M4	F7			H7				
Review of Proposed Hydraulic Modeling Techniques	17	Feb-02	Apr-02	x	M5	F8			H8				
Obtain Map Boundaries	18	Feb-02								G6			
Prepare Base Maps on USGS Grid	19	Mar-02	May-02	x	M6					G7			
Written Summary of Initial Data Research, Proposed Methodologies and Work Plan	20	Mar-02			M7	F9				G8	P9		
Submission of Sample TIN data	21	Apr-02		x	M8		L7						
Select Rainfalls for 10, 2, 1 and 0.2 Percent Frequency Events	22	Apr-02							H9				J13
Submit Diagram of Proposed DFRIM Panel Layout	23	May-02			M9	F10				G9			
Submit Description of Proposed DFIRM Base Map	24	Jun-02			M10					G10	P10		
Plot Map Boundaries	25	Jun-02	Jul-02		M11					G11			
Independent QA/QC of LIDAR	26	Jun-02	Nov-02	x	M12			T3					
Checkpoint Analyses of TIN data	27	Jul-02	Nov-02		M13			T4					
Submit TIN on CD-Rom	28	Jun-02			M14		L8						
Review Plot of Boundaries	29	Aug-02		x	M15					G12			
Base Map Acquisition	30	Sep-02	Oct-02	x						G13			
Prepare Base Maps - Streets, Railroads, Canals, Ditches, Benchmarks, etc.	31	Oct-02	Jan-03	x	M16					G14			
Identification of Sensing Voids and Methods Used to Supplement Them	32	Oct-02	Apr-03					T5					
Submit Documentation for Sources and Methodologies for Map Features	33	Jan-03			M17	F11				G15			

Jefferson Parish DFIRM
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Task Description	Task No.	Start Date	End Date	QA/QC	MCC	FEMA	LIDAR	Topogrpahy	Hydraulic and Hydrology	GIS/Data Base Manager	Program Manager	USACE	Jefferson Parish
Submit Annotated Copies of Effective FIRMs Depicting Limits of Study	34	Jan-03			M18	F12				G16			
Reivew Non-revised Study Areas	35	Jan-03	Feb-03	x						G17			
DFIRM Production - Non-Revised Areas	36	Jan-03	Apr-03		M19					G18			
Independent QA/QC of Hydrology	37	Feb-03	May-03	x	M20	F13						C3	J14
Supplement UNET Data	38	Apr-03	Jun-03	x				T6	H10				
Prepare Hardcopy Topo Maps	39	May-03	Jul-03							G19			
Submit Elevation Data/Topogrpahic Mapping	40	Jul-03		x	M21		L9	T7					
NGS Data Sheets for Network Control Points	41	Jul-03					L10	T8					
P.E./P.L.S. Certification of Topographic Information	42	Jul-03		x	M22		L11	T9					
Submission of Sample Hardcopy Topographic Maps	43	Jul-03		x	M23			T10		G20			
Documentation for LIDAR and Topographical Data	44	Jul-03			M24		L12	T11		G21			
Hydrologic Modeling	45	Jun-03	Sep-03	x					H11				
Convert UNET Data	46	Jun-03	Oct-03	x					H12				
CHECK-2 and CHECK-RAS Runs, If Hec-2, HEC-RAS Selected	47	Jul-03		x	M25	F14							J14
Review Model Calibration and Verification	48	Jul-03	Aug-03	x	M26				H13		P11		J15
Hydraulic Modeling	49	Jun-03	Sep-03	x					H14				
Review of Bridge and Culvert Model Representation	50	Jun-03		x									J16
Submit Topographic Maps Showing Proposed Cross-section Locations	51	Oct-03			M27				H15	G22			

Task Description	Task No.	Start Date	End Date	QA/QC	MCC	FEMA	LIDAR	Topogrpahy	Hydraulic and Hydrology	GIS/Data Base Manager	Program Manager	USACE	Jefferson Parish
Cross-sections Within Delineated 500 yr floodplain	52	Oct-03	Jan-04	x				T12		G23			
Create Sample Pilot Data Set	53	Oct-03		x	M28					G24			
Submit Digital Files Containing DFIRM for One Panel and Associated Data	54	Dec-03		x	M29					G25			
Independent QA/QC of Hydraulics	55	Feb-04	May-04	x	M30	F15						C4	J17
Submit Digital Copies of all Hydrologic and Hydraulic Modeling	56	Feb-04			M31	F16			H16	G26			
Submit Hydraulic Models and Sample Floodplain Mapping in TSDN Format	57	Feb-04			M32				H17	G27	P12		
Submit Draft Hydrologic Analyses in TDSN format	58	Feb-04			M33				H18		P13		
Submit QA/QC Report on Computational and Data Processing Procedures	59	Feb-04			M34				H19	G28	P14		J18
Submit Floodway Data Tables	60	Feb-04			M35	F17				G29			
Submit First Panel of Digital Map Along with Data Files	61	Feb-04		x	M36					G30			
Submit Flood Insurance Study	62	Jun-04			M37	F18				G31	P15		
Add BFEs, Floodplains, etc. to Base Maps	63	Feb-04	May-04	x					H20	G32			
Review of Engineering	64	Feb-04		x	M38				H21				J19
Submit Certifications of Hydrologic and Hydraulic Analyses	65	Feb-04			M39				H22				
Independent QA/QC of Floodplain Mapping	66	Mar-04	May-04	x	M40								J20
Submit Completed Draft Plots of DFIRM Panels	67	Jun-04			M41					G33			
Submit Computer Files of Draft Plots of DFIRM Panels	68	Jun-04			M42					G34			